Contents

	Preface	v
	Abbreviations	xi
1	Introduction to flexible manufacturing	1
Î.1	The march of industrial progress	1
1.2	What is computer-integrated manufacturing (CIM)?	4
1.2.1	Industry	4
	Manufacturing	5
	Integration	
1.2.3	Computers	9
1.2.4	The CIM hierarchy	10
1.2.6	The application of CIM	13
1.2.0	The application of Chil	
2	What is FMS?	15
2.1	Evolution of FMS	15
2.2	Definition of an FMS	16
	FMS equipment	17
2.2.2	Types of FMS	21
2.2.3	Applications of FMS	21
2.2.4	FMS configurations	21
2.3	The FMS host computer	22
2.4	FMS concepts	23
2.4.1	System mixes	23
2.4.2	Further basic concepts	26
2.4.3	FMS host—operator interfaces	29
2.4.4	Decentralized hardware/software system design	30
3	Why use an FMS?	31
3.1	Modern market requirements	31
3.2	Modern manufacturing methods	33
3.2.1	Advanced manufacturing technology (AMT) to increase	
3.2.1	productivity	3.
3.2.2	Types of FMS	30
3.2.3	The object to be achieved by an FMS	30
3.2.3	Types of flexibility	3
3.3.1	FMS user flexibility	39
3.3.2		4
3.3.3	How to achieve the flexibilities	4
		4
3.3.4	Productivity	
4	How an FMS works	5
4.1	Functions of an FMS host computer	5
4.1.1	A manufacturing strategy for flexibility	5

4.1.2 4.2.1 4.2.2 4.2.3 4.2.4 4.3 4.3.1 4.3.2 4.3.3	Host system design FMS host function requirements FMS host and area controller function distribution FMS master host tasks Subordinate FMS host tasks	52 56 59 59 64 65 71 71 72 72
5 5.1 5.1.1 5.1.2 5.1.3 5.1.4 5.2 5.3 5.4 5.5 5.6	How to develop your FMS Planning phases Awareness phase – what can an FMS do for me? Planning phase – what should an FMS do for me? Installation phase – how do I install my FMS? Operation phase – how can I best use my FMS? Integration System configuration FMS layouts Simulation FMS project development steps	75 75 75 75 77 77 78 79 80 80 85
6.1 6.2 6.3 6.4 6.4.1 6.4.2	How to implement your FMS Contracts Project management FMS primary and secondary equipment development FMS host system development Planning Development	87 87 89 92 92 93 95
7 7.1 7.1.1 7.1.2 7.1.3 7.2 7.2.1 7.2.2 7.3 7.4 7.4.1 7.4.2 7.5	How to install your FMS Communication interface characteristics Computer/controller interfaces Interface test characteristics Objects of the tests Test sequences Preparations for testing Points to consider during commissioning Training System acceptance Host acceptance Total FMS acceptance Post-acceptance activities	103 103 103 105 107 107 107 109 111 113 114 115
8 8.1 8.2	How to apply your FMS investment for profit Types of FMS investment Analysis of all the benefits	117 117 118

8.3 8.3.1 8.3.2 8.4	Types of investment appraisal Total investment costs Operating savings Self-financing the FMS	119 121 123 125
9	Four examples of FMS	127
9.1	The HNH FMS	127
	The system layout and facilities	127
9.1.2		129
9.1.3		130
9.1.4	Production parameters	131
9.2	The Rover LM-500 FMS	131
	The system layout and facilities	132
9.2.2	The FMS host control	135
	The Vickers FMS	135
9.3.1	The system layout and facilities	137
9.3.2	The FMS host control	138
9.4	The KWU FMS	138
9.4.1	The system layout and facilities	140
9.4.2	The FMS host control	141
	Index	143